

Application No. 10/736,801
Reply to Final Office Action of December 11, 2009

IN THE CLAIMS:

1-23 (Canceled)

24. (Previously presented) A method for generating a genetically modified yeast organism for drug screening, which comprises the steps of:

(a) causing heterologous expression of at least one protein or protein fragment by genetic modification by introducing a foreign gene into the yeast organism having a phenotype, wherein the expression of the at least one protein or protein fragment does not produce a detectable change of the phenotype perceptible from outside of the yeast organism, wherein a detectable change of the phenotype that is perceptible from outside of the yeast organism comprises the behavior of the yeast organism, the morphology of the yeast organism, or a combination thereof;

(b) analyzing the modified gene expression pattern and identifying compensating differentially regulated genes; and

(c) phenotyping the yeast organism wherein phenotyping is carried out following the reduction or elimination of compensating differential expression perceptible from the outside of the yeast organism.

25. (Previously presented) The method of Claim 24, wherein the modified expression in step (a) is inducible.

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26. (Previously presented) The method of Claim 25, wherein the genetic modification comprises introducing a vector which enables the at least one protein or protein fragment to be inducibly expressed.

27. (Previously presented) The method of Claim 26, wherein the vector is inducible with galactose or copper tetracycline.

28. (Previously presented) The method of Claim 26, wherein the genetic modification comprises a knock out.

29. (Previously presented) The method of Claim 28, wherein the knockout is an inducible knockout.

30. (Previously presented) The method of Claim 24, wherein the yeast organism is the strain *S. cerevisiae*.

31. (Previously presented) The method of Claim 30, wherein the modified gene expression is analyzed with the aid of DNA or protein microarrays.

32. (Previously presented) The method of Claim 24, wherein the differentially expressed gene is less strongly expressed than in control organisms and the reduction or elimination of the

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differential expression is carried out by enhancing expression of the differentially expressed gene.

33. (Previously presented) The method of Claim 32, wherein the reduction or elimination leads to growth inhibition of the cell organism.

34. (Previously presented) A genetically modified, phenotyped yeast organism, obtained by the method of Claim 24.

35. (Currently amended) A genetically modified yeast organism, comprising:

(a) a genetically modified expression of at least one ~~endogenous or~~ foreign gene, which results in compensating differential expression of at least one other gene endogenous to the modified yeast organism; and

(b) a phenotype caused by the reduction or elimination of the compensating differential expression of the gene, wherein the phenotype is perceptible from outside of the modified yeast organism and comprises behavior of the yeast organism, the morphology of the yeast organism, or a combination thereof.

36. (Previously presented) A method for identifying a substance having an effect on the function of a heterologously expressed protein or protein fragment, which method comprises the steps of:

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(a) contacting the substance with the genetically modified yeast organism of Claim 34 or Claim 35; and

(b) measuring the change in the modified yeast organism as compared to a genetically unmodified yeast organism.

36. (Cancelled) An assay for drug screening using at least one phenotyped yeast organism of Claim 34 or 35, which comprises the steps of:

- a) determining the phenotype of the yeast organism;
- b) contacting the substance to be tested with the yeast organism; and
- e) observing a modification of the phenotype.

38. (New) An assay for drug screening using at least one phenotyped yeast organism of Claim 34 or 35, which comprises the steps of:

- a) determining the phenotype of the yeast organism;
- b) contacting the substance to be tested with the yeast organism; and
- e) observing a modification of the phenotype.